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ABSTRACT

In 1974 the U.S. Office of Education (USOE) established, under the Elementary and Secondary Education Act, Title III, Section 306, a network of agencies called the National Diffusion Network. This network was designed to bring together representatives of federal, state, and local agencies to promote the exchange of successful ideas, materials, and programs. Programs that have been identified as successful and validated by the Dissemination Review Panel are made available through the network to local education agencies interested in instituting these programs in their schools. This document is the first in a series of reports to be produced in connection with an evaluation of the network by the Stanford Research Institute. Section 2 of the report chronicles the evolution of the network over the last two decades. This section details how the network incorporates experience gained through USOE's past efforts to disseminate educational innovations. Section 3 attempts to place the National Diffusion Network within the context of the literature concerning diffusion of innovations. This overview of research literature describes three major models and characteristics of three major stages of the diffusion process relevant to evaluation of the network. (Author/JM)

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EVALUATION OF THE NATIONAL DIFFUSION NETWORK: EVOLUTION OF THE NETWORK AND OVERVIEW OF THE RESEARCH LITERATURE ON DIFFUSION OF EDUCATIONAL INNOVATIONS

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OVERVIEW

In 1974 the U.S. Office of Education (USOE) established under the Elementary and Secondary Education Act, Title III, Section 306, a federal/state/local network of agencies to interact in specified ways to bring about the sharing of worthwhile innovative practices. The goal of the National Diffusion Network (NDN) is to encourage the communication of successful ideas, materials, practices, and programs by their developers and the adoption and implementation of these ideas and practices by other educators who determine that specific programs will meet their local needs.

USOE's Office of Planning, Budgeting, and Evaluation has contracted with Stanford Research Institute (SRI) to evaluate the Network by describing the Network, assessing its efficiency and effectiveness, identifying factors associated with adoptions, and offering recommendations regarding policy.

This is the first in a series of reports to be issued as part of SRI's evaluation of that National Diffusion Network. The purpose of this document is to provide a context for the evaluation. The report is divided into two sections. The first section traces the history of the National Diffusion Network and the activities that led to its development. The second section presents an overview of the literature related to previous research on diffusion of educational innovations. The historical section indicates how the Network reached its current state of development, and the overview of the literature indicates what aspects of the Network's current state of development are salient for evaluation.

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I INTRODUCTION

As part of its continuing interest in identifying successful educational practices and encouraging the spread of these practices to schools across the nation, the U.S. Office of Education (USOE) has established a National Diffusion Network. Created in 1974 under the Elementary and Secondary Education Act (ESEA) Title III, Section 306, this Network is designed to bring together representatives of federal, state, and local agencies to promote the exchange of successful ideas, materials, and programs within and across state lines. Programs that have been identified as successful and validated by the Dissemination Review Panel (DRP) are made available through the Network to Local Education Agencies (LEAs) interested in installing these programs in their schools.

In addition to USOE, key elements of this Network are program developers, adopters, and facilitators who serve as linking agents between developers and adopters. As appropriate, potential adopters are given assistance in assessing their specific educational needs and in identifying programs from the Network pool that meet these needs. Provision of materials, training, and other technical assistance to adopters generally continues into the implementation stage; in some cases, financial support to help defray the expenses of adoption also is provided.

USOE's Office of Planning, Budgeting, and Evaluation has contracted with Stanford Research Institute (SRI) to develop comprehensive and objective evidence regarding the scope and function of the National Diffusion Network. The SRI study is oriented toward examining the following aspects of Network operations:

- The adoption process--how adoptions occur; what time, effort, and cost factors are associated with successful adoptions.
- The mediating process--what tactics and strategies are used by developers and facilitators to diffuse the DRP-approved programs and how these differ in effectiveness.
- Context and receptivity--what factors tend to predispose an LEA to interact with others in the Network and to adopt one of the available programs.
- Program features--what types of programs lend themselves to diffusion through the Network and to successful adoption by interested LEAs.

The principal objectives of the SRI evaluation of the National Diffusion Network are as follows:

- To identify the major influences or determinants of adoption and implementation of educational innovations.
- To establish the functional and operational characteristics of elements within the National Diffusion Network, as well as the Network as a whole, and the influences of these characteristics on adoption of innovations.
- To identify interrelationships among attributes of innovations, adopters, and change agents within the context of the Network, as they affect diffusion and adoption of innovations.
- To isolate costs and resource requirements entailed in the Network diffusion/adoption process and to investigate variations in return (adoptions), as functions of these programmatic and resource inputs.
- To identify strategies for improving the effectiveness or efficiency of the Network.

The current document is the first in a series of reports to be produced in connection with the SRI evaluation. This document is designed primarily to place the National Diffusion Network and the SRI evaluation in the context of related efforts in the area of educational innovation and diffusion.

Section II of this report relates the evolution of the Network to growth and shifting emphases of federal roles in education over the past two decades. The history of federal participation is traced briefly, beginning with legislation of the late 1950s and early 1960s that was designed to encourage educational reform by supporting research and development. The mid-1960s brought a new emphasis on action research, with Federal support for innovation and change targeted to schools and school systems. Early attempts at dissemination of findings from these activities failed to initiate widespread reform; thus, emphasis recently has been given to developing delivery systems and comprehensive strategies for diffusion of successful programs and practices. The National Diffusion Network represents one of these strategies. The growth and development of the Network is traced through the preliminary planning phase and the first year of its operation. The size, scope, and components of the Network are described, and several major developmental themes that emerged during the first year are reviewed.

Section III attempts to place the National Diffusion Network within the context of the literature concerning diffusion of innovations. The review is organized into four subsections. In the first, several major models of the educational innovation diffusion process are discussed. In the subsequent subsections, research findings on characteristics of the innovation, linkage, and adoption stages of diffusion are discussed. Variables identified in the literature that appear relevant to the Network evaluation are listed and defined. These listings represent cross sections of the accumulated research and illustrate the range and diversity of potentially relevant variables. The discussion of research and summaries of relevant variables are intended to be neither exhaustive nor necessarily representative. Indeed, the current literature contains more than 3,000 publications on innovation and change. Therefore, this paper focusses on studies and variables that we believe are important and pertinent to the evaluation of the National Diffusion Network.

Each set of research findings is critiqued with regard to gaps and the need for further research. These critiques are intended as comments on the scope and completeness of previous research rather than its quality. Some implications of research gaps for the Network evaluation are suggested, although the specific rationale and details of the evaluation are presented in a separate document ("The Study Design and Analysis Plan").^{1*}

* All references are listed at the end of the report.

II THE EVOLUTION OF THE NATIONAL DIFFUSION NETWORK

Introduction

The federal role in education has increased dramatically within the last two decades as a result of the challenges of "big science", Soviet space technology, civil rights, antipoverty movements, and other postwar trends. Expectations for educational programs grew apace so that by the mid-1960s when the ESEA was passed, educational reform came to be thought of as a possible cure for national problems.

As a response to these challenges, federal legislators authorized more support for educational research and development (R&D) with the hope that research would increase the rate of educational improvement. A large amount of information was generated as a result of R&D funding. The information tended to remain within the research community, however, and further federal action was needed to disseminate the information to practitioners so that it could be put to use. Federal spending on educational research and training increased sharply during the 1960s. Yet these efforts to produce educational reform through research and information dissemination were inadequate.

While researchers were developing practices based on new theoretical developments, the public education community was simultaneously developing new practices in the schools--for disadvantaged children under ESEA Title I and innovative practices and supplementary educational services under Title III. Although these schools were encouraged to demonstrate and disseminate their innovative practices, the spread of these programs was very limited also.

A more active means of dissemination was needed. In the last few years, several alternative dissemination mechanisms have been considered and tried. One recent response to this need was the creation of the National Diffusion Network in 1974 using discretionary funds provided by the last two-years' allocation of funds under Section 306 of ESEA, Title III. The Network is charged with:

- Disseminating exemplary programs to schools throughout the United States.
- Offering training and technical assistance to educators interested in using the programs.

Early Legislation to Improve Education

An initial response to postwar challenges to improve American education was the Cooperative Research Act in 1954 that supported small-scale research efforts. Also in 1954, the National Science Foundation was authorized to support R&D of education in the sciences. The National Defense Education Act in 1958, geared toward research in media for education and in foreign language education, was considered a step toward active federal support for education.

Federal expenditure on education in general and on educational R&D in particular increased dramatically in the 1960s. The tabulation below shows the expenditures on education and all R&D as a percentage of the gross national product (GNP) from 1930 to 1970. (See Paisley, 1975, Table 3.A/T2.)²

<u>Year</u>	<u>GNP</u> <u>(\$ billions)</u>	<u>Education</u> <u>as % of GNP</u>	<u>All R&D</u> <u>as % of GNP</u>
1930	\$ 90.3	3.8%	0.2%
1940	99.6	3.0	0.3
1950	284.7	3.4	1.0
1960	503.7	5.3	2.7
1970	977.1	7.7	2.7

This increase supported a number of new laws. Among these were:

1961--Under Cooperative Research authorizations: curriculum improvement in English, language arts, and social sciences.

1963--Under the Cooperative Research Act: research in education for the handicapped and the establishment of the first R&D Center Program. (This program was later incorporated under the ESEA, 1965. By 1969, 20 Centers had been created, all located on major university campuses. Each Center was to support R&D and dissemination of developments concentrated around a specific educational problem.)

1963--Vocational Education Act: development of projects to help students prepare for post-secondary careers.

1965--ESEA: a variety of educational programs including:

- Title I providing educational support to disadvantaged children.
- Title III supporting development and dissemination of new educational methods.
- Title IV creating Educational Laboratories. (The laboratories were to develop and demonstrate educational alternatives. By 1966, 20 such laboratories had been established.)

1965--Higher Education Act: research on libraries and information services.

1967--Education Professions Development Act.

Educational Information Dissemination

Federal Action

As programs were developed to solve national problems, another effort was necessary. Federal support for educational R&D and for development of new practices in the schools created a vast amount of information. This information did not automatically diffuse, however, to the education community as was originally anticipated. Structures were needed to facilitate the diffusion.

USOE's first major attempt to establish a structure for dissemination was the Educational Resources Information Centers (ERIC) in 1963. ERIC is a system of clearing-houses with a central coordinating office. ERIC collects current educational material, abstracts it, puts it onto microfiche and has the capability of reproducing information for educators and researchers at a low cost. Criticism of the system is that the effort required to secure the information is too great for most educators.³ Consequently ERIC has failed to reach most of the educational community.

OE's second dissemination effort came at the end of the 1960s. Putting Research into Education Practice (PREP) was a series of reports on current educational topics sent to state departments of education to be distributed within the state. PREP did not rely on the practitioners to retrieve the information as did ERIC and therefore reached more educators. PREP seemed to start a trend of other educational publications (e.g., the "It Works," "Modern Programs," "Childhood Education," and "ALERT" materials were designed to inform educational practitioners about successful programs).³

Other dissemination efforts were initiated during the late 1960s. These included Research Coordinating Units funded through the Vocational Education Act and ESEA funding of School consortia geared to identifying needs and trying out selected innovations.

Early in the 1970s, Congress recognized the importance of disseminating education information by establishing, through the Education Amendments of 1972, the National Institute of Education (NIE). NIE's goal was to reform educational practice in America. To do this, the Institute was to conduct educational R&D and to design and organize dissemination efforts. At the same time, Congress encouraged OE to continue its own dissemination activities.

One attempt in this direction was an OE-NIE joint program patterned on the extension agent model of the Department of Agriculture. Since activities of the 1960s had not brought the expected changes, the extension agent program was to establish more effective contact between the ERIC resources and the users by having agents (primarily former teachers) serve as intermediaries. This Pilot State Dissemination Program initially supported three state departments of education with educational extension agents who were backed by a central retrieval facility using ERIC and other sources. Later, this program was extended to other areas. The evaluator of this program concluded that "the ERIC system and other resources will not reach the classroom teacher without the intermediary of extension agents with teaching backgrounds."

Early attempts at improving American education demonstrate that neither research alone, development of new practices, nor simple dissemination of information would bring desired educational reform into the schools. It became clear that: exemplary programs needed to be continually identified; the needs of the schools should be matched with available programs; and more active support, such as detailed information, training, and continuing technical assistance to program adopters should be offered if innovations were to be channeled into schools.

Early Stages Under ESEA Title III

ESEA Title III was authorized to disseminate its exemplary programs, but not until the 1970s did the program offices in USOE become active participants in educational dissemination. It became evident that if projects were to be disseminated into the teaching community, some evidence of program effectiveness, cost, and exportability was needed. In response to this need, the Identification Validation Dissemination (IVD) process and an accompanying manual were designed to provide standards for identifying successful programs and to provide some form of consumer

protection to schools looking for projects to serve their needs. On the basis of validating sessions, Title III issued Innovative Educational Practices which included a catalogue of programs and practices approved for dissemination.⁵

Concurrent with the IVD, OE developed the Dissemination Review Panel (DRP) in which NIE eventually became a participant. The DRP was to review and assess federally supported programs to ensure the high quality of products to be disseminated. The DRP criteria for judging the innovations were: educational significance of reported learning gains and efficiency of the operating processes. In November 1974, OE's Bureau of School Systems was given responsibility for maintaining a master file of DRP-approved projects and materials and for developing strategies to disseminate these projects.

During the 1974-75 school year, ESEA, Title III, Section 306 funds were used to support two efforts at nationwide diffusion of DRP-approved programs. One was the field test of six Project Information Packages (PIPs) in 17 school districts. These packages were designed to allow practitioners in local school districts, with a minimum of outside assistance, to select, install, and operate programs that had been judged effective. The other effort was the National Diffusion Network.

National Diffusion Network

Design

The National Diffusion Network originally was funded in 1974 to support nationwide diffusion of DRP-approved projects. Specifically, the Network supported three groups of participants:

Developer/Demonstrators (DDs)--These are DRP-approved projects. In general, DDs obtain their own support for project costs and receive federal support to provide other local schools with

information, training, and technical assistance to promote adoption of the model program. Thirty-one DDs originally were funded, and six more were added later in the year.

State Facilitators (SFs)--SFs provide information about DDs to schools within the SF's state, help interested schools match their needs with available programs, and generally provide limited financial assistance to potential adopters to help cover costs of visiting demonstrations or introducing the new programs in their schools. Fifty-four SFs in thirty states were funded in the first year. (Because some states did not have adequate Title III, 306 funds available for FY 1974, they were ineligible for the SF program. In several states, however, the State Education Agency (SEA) Title III Coordinator was able to take on these facilitator responsibilities; these states could then participate in the Network.)

Adopter Projects--Local schools interested in adopting a project could apply for support for start-up costs such as training, materials, and technical assistance from the DD.⁶ As a long-term federal strategy, support for this group was not viewed as effective or appropriate. Therefore, funding of Adopter Projects was later discontinued.⁷

Definition of Roles

Once DDs and SFs were funded and the Network organization was begun, a number of problems and ambiguities in the design became obvious. For example: What did "diffusion" mean? What information should be exchanged between DDs and SFs? Who should select Adopters? What criteria should be used for selection?

An orientation meeting convened in July 1974 in Arlington, Virginia, to clarify some of the issues and to facilitate communications among participants in the Network. In addition to DDs and SFs and OE representatives at the meeting, others such as publishers, regional labs, and consultants were present to offer ideas of diffusion tactics.⁸ Concerns were discussed, and a plan was developed to clarify roles. To reach consensus on roles and division of labor, participants were asked to

complete a questionnaire on "Diffusion Roles and Role Relationships." The questionnaire listed functions and asked who should be involved and at what level of responsibility.⁹

A second meeting in August in Kansas City was attended mainly by state facilitators to continue the clarification of roles and other issues. Five major problem areas were addressed:

- Feasibility of a national communication network.
- The nature of SF's relationship to DDs and to projects approved by the DRP, but not receiving Title III funds to support diffusion activities, referred to as DRPs.
- The function of the facilitation process.
- The nature of role assignments.
- Evaluation of SFs.

Task groups were formed to make recommendations for each issue. To define the facilitation process, certain activities were suggested for making schools aware of DDs and for responding to interested school districts. Analysis of the July questionnaire clarified some of the role assignments and further recommendations regarding role definitions were made at the meeting. One important recommendation was the adopters should be committed to the program and be willing to participate in an outcome survey.¹⁰

Recommendations for roles and relationships from these summer meetings strongly influenced Title III's statement, "Policies and Procedures."¹¹ In brief, roles were now defined as follows:

OE--Responsible for assisting communication with the Network, identifying potential DDs,* setting time lines, evaluating the Network, and providing technical assistance.

SFs--responsible for providing aid in assessing needs of adopters, disseminating information about adopters and DDs, monitoring adoption, and helping DRPs financially, if possible.

DDs--responsible for providing awareness materials; designating for adoption purposes the essential components of their programs; selecting adopters; and providing demonstration, training, follow-up, and evaluation for adopters. To promote nationwide diffusion, DDs were to ensure that the majority of their adopters were out of state.

SEAs--responsible for defining their roles cooperatively with their SF.

The "Policy and Procedures" statement was circulated to all DDs and SFs with a request for a revision of work plans according to the specifications mentioned above. These revisions were submitted in October and reviewed by the beginning of the year.¹¹

Internal Communication

Communication among all parts of the Network was another major concern in the developmental stages of the work. As a beginning, participants in the Arlington conference had requested OE to synthesize comments from the meeting and to keep the Network informed of any subsequent papers or policies. Another recommendation at the meeting was that all participants work closely in developing a catalogue of descriptive materials about Network activities.¹²

* There had been complaints that the pool of DDs was not large enough. OE encouraged use of DRPs if other funding could be found. All Network participants were encouraged to inform OE of potential DRP candidates. This has met with mixed reactions because without funds, DRPs have difficulty responding to requests for assistance; some even report that the Network has disrupted their activities.

More concrete steps to improve communication were taken as a result of the Kansas City meeting. It was decided that the California SF would print a monthly newsletter, The Facilitator, available on a subscription basis to DDs, SFs, SEAs, and the OE. A chart explaining how to get in touch with DDs in each state was distributed at the meeting. The OE and the Florida SF volunteered to compile a catalogue of DDs by October, and an offer was made to develop a system to keep such a catalogue up-dated. The OE requested quarterly reports from SFs to monitor the progress of their activities. Finally, at the suggestion of the Massachusetts SF, moves were made to organize personal communication links for all participants within geographic regions.¹⁰

In January, the Director of Title III sent out a memo to DDs, SFs, and Title III coordinators asking these groups to take certain steps to improve communications within the Network. DDs were asked to ensure that awareness materials and instructional materials were sent to all SFs and that awareness materials were made available to SEA Title III coordinators in states without SFs. DDs were asked to inform OE monthly of their capabilities for training new adopters. The OE would then send this information to SFs. SFs were asked to provide schools within their state and DDs with information about their SF role and capabilities. All materials produced by SFs and DDs were to be made available to OE.¹³

The Massachusetts Facilitator project, Massachusetts Diffusion Assistance Program (MDAP), has been a key element in the communication Network. MDAP developed a manual, National Project for Local Adoption, that was originally intended for use within the state, but has been used by a number of other states. In addition, MDAP contracted with OE for assessment purposes to produce a Directory of SFs by March 1975, a Handbook of Strategies and Techniques used by SFs by April, a Casebook of Selected SFs by June, and a case study of projects applying for DRP approval, Program Validation-Four Case Studies.¹⁴

Evaluation Planning

Efforts toward assessment and evaluation began in 1974. In December, 20 SFs met in Albuquerque, New Mexico, to discuss recurring role ambiguities and communication problems and to recommend indicators of success for the Facilitator program. As a result, all SFs were asked to respond to a questionnaire soliciting opinions regarding the most meaningful national indicators of program success. Analysis of the listed responses ranked indicator categories with an indicator assigned to each:

Awareness:	quantify linkages between SF and adopters	
Adoption:	quantify adoption	
Education:	quantify pupil achievement	
Management:	measure cost-effectiveness	15
Consultation:	quantify technical assistance beyond awareness.	

In January, 1975, DD and SF representatives, a Title III officer, and the Magi Educational Services met to discuss strategies for formulating an interim evaluation of the Network. The group recommended that OE write evaluation specifications and send them to DDs and SFs for comment.¹⁶ The result was a list of descriptive criteria for the Network, "Characteristics of a Desired Diffusion and Adoption Delivery System." Discussion of the list was to occur in St. Louis at the meeting sponsored by CEMREL Incorporated in late February.¹⁷

Although the major emphasis of the CEMREL meeting was on regional Labs and their potential assistance to the Network, some discussion relevant to an evaluation did take place. The DDs attempted to define an effective DD and SF. The OE's criteria were revised. Finally, some conference participants met in San Francisco in March to make further revisions of the criteria. Subsequently a memo was sent to OE, SEAs, SFs, DDs, and regional Labs asking them to consider the list of criteria and to indicate the function, at their respective levels, which implemented each criterion.¹⁸

Other First-Year Developments

Other Network events of note occurred. Another outgrowth of the CEMREL meeting was a small self-appointed task force that met to explore further the potential of Lab and Center participation in the Network.¹²

A meeting of SFs and OE was held in June to discuss the use of computer technology for the Network.²⁰ Also, some DDs, and SFs, and others met in June to discuss developing incentives for adopters.²¹

By February, it was clear that Title III, Section 306 funds would be available to the Network for another year. A Request for Proposal went out for an overall evaluation of the Network. The evaluation was to study the operations of the Network, to determine its impact on local education agencies, and to determine the adoption rate of programs. Some of the other areas to be covered were roles and characteristics of adopters and of effective DDs, SFs, and SEAs.²² The contract was awarded to SRI in June.

Plans for a Second Year

As the Network began its second year of operation, two memos were sent to school districts. One asked for applications for continued support and the other requested new DD and SF applications.^{23, 24} Thirty-six new DDs (including 6 PIPs) and 22 new SFs were funded for FY 1975-76. This brought the total to 73 DDs and 77 SFs (representing 36 states).⁸

To launch the second year, USOE hosted an orientation conference at the end of July 1975 in Washington, D.C., for new DDs and SFs. A major focus of this three-day meeting was a review of activities and accomplishments of the Network during the first year. Emphasis was placed on defining the general functions carried out by each participant category, yet the flexibility allowed DDs and SFs for developing their own methods of carrying out these functions was acknowledged as well.

A second theme of the conference was the importance of communication and cooperation among participants. Continuing DDs and SFs described their experiences during the first year and repeatedly encouraged new participants to share information and materials so as to learn from each other and to avoid duplications.

Another area of interest was documentation of Network activities and assessment of its accomplishments and impacts. The Magi staff presented a summary of their survey of DDs and SFs and noted some of the typical responses. SRI presented an overview of the planned 1975-76 evaluation.

In addition, the recent addition of Far West Regional Laboratories to the National Network was announced. Far West had been contracted by Title III to offer technical assistance services to Network participants.

A final concern raised, but unresolved, was the future of the Network. Title III, Section 306 funds were due to expire within a year. Although possible sources of future support were being explored, no definite sources of funds beyond the second year had been identified.

Recent Federal Activities Concurrent with Network Activities

Other notable activities have occurred that are relevant to the diffusion efforts of the Network. Two studies being conducted by OE's Office of Planning, Budgeting, and Evaluation are particularly relevant. One is an evaluation of the previously mentioned PIPs as a dissemination device. Another is the RAND study of USOE-funded change agent programs. The study draws its data from four ESEA programs including Title III projects. It focuses on a description of the process of innovation and on what factors affect the outcome of attempts to implement change.²⁵

A second activity is represented by recent NIE developments. Both NIE's original purpose and subsequent plans have run parallel to the diffusion activities of Title III. A recent proposal for an NIE School Practice and Service Division program outlines the following goals:

- Development of a Consumer Information Component to be coordinated centrally, to offer verified information in usable formats, and to disseminate the information.
- Development of an R&D utilization component coordinated by SEAs and LEAs to assist problem solving, to test and adapt information from the first component, and to select and implement the information.

Numerous other recent activities in NIE as well as OE's Right to Read and Vocational Education programs also should be mentioned. These in conjunction with the Network developments illustrate an unmistakable attempt on the part of the Education Division of HEW to develop and promote diffusion of educational products.

Summary

In retrospect, the National Diffusion Network incorporates experience gained through OE's efforts over the past decade to disseminate educational innovations. Programs emerging from R&D of the 1960s and programs developed through action research have been identified. As the federal government developed a more active dissemination strategy, programs were approved or validated to provide an endorsement for interested educators. Linking agents or facilitators were recognized as essential intermediaries, bringing together program developers and practitioners who otherwise would not have the resources to seek out each other. Finally, communication devices, such as written materials, training, and technical assistance, were found to be vital to the diffusion process and have been made available to educators interested in the validated programs.

III OVERVIEW OF THE RESEARCH LITERATURE

Introduction

An overview of the extensive research literature on the diffusion of educational innovation is presented in this section. The purpose of this overview is to provide a context for the National Diffusion Network evaluation study and to indicate the general relationship of the evaluation to this body of literature.

A discussion of several major models is presented first, followed by subsections dealing with the three major stages of diffusion: innovation, linkage, and adoption. Each of these last three subsections is divided into two parts, one covering agent or actor characteristics that have been studied in each stage, and the other covering process or action characteristics. Agent characteristics are those of innovator, linker, and adopter; process characteristics are those of innovation, linkage, and adoption.

Dividing the literature into the six parts emphasizes the characteristics of major roles and functions entailed in the diffusion of educational innovation. These roles and functions should not be confused, however, with the discrete entities that perform them. Any single entity, whether an individual or an organization, can perform multiple roles or multiple functions either sequentially or simultaneously. This is illustrated in the National Diffusion Network by the DDs who perform both innovator and linker roles.

In each of the six agent (role) or process (function) parts, a relatively small number of studies is described. Studies were selectively chosen for inclusion in the part if they were major or important

contributions, illustrative or representative of research or generally relevant to the evaluation study.

At the end of each literature review, a summary list of major characteristics or variables that have been studied in that part of the literature is presented. Sources of items on these lists include, but are not limited to, the small selection of studies described. Categorizations and definitions of variables on the lists have been adapted from the literature to suit the needs of the current study.

Each major subsection of the review concludes with a critique of the literature. These critiques are intended as comments on the scope and completeness of previous research rather than its quality. The critiques compare the scope and completeness of previous research on a general level, with the current study's pattern of emphasis in data collection.

Major Diffusion Models

Description

Many diffusion models of varying degrees of comprehensiveness have been proposed in the literature. For reasons of historical-political significance, currency, and overall quality, three of these models assume major importance for the evaluation. These three are: the Research, Development, Dissemination, and Adoption Model (RDDA);²⁷ the Configuration Model;²⁸ and the Innovative Process Model.²⁹

The RDDA Model has been dominant in conceptualizations of educational innovation diffusion for a number of years and has been used to guide federal funding of diffusion efforts. The model is a systems view of the process of educational innovation. It posits a linear functional linkage between separate institutions devoted to education research, development of educational programs, dissemination of programs, and, finally, adoption of programs. The model assumes that a large investment

of resources coordinated and directed to specified important social objectives will result eventually, via the linkages between these institutions, in the widespread adoption of high-quality and useful educational innovations.

The RDDA Model has been criticized recently by Clark and Guba (1974)²⁸ who, ironically, were responsible for its emergence and popularity. They now argue that the institutions responsible for educational innovation are not necessarily related to each other in an orderly, logical system as posited by the RDDA Model, but rather relate as complex configurations of overlapping and occasionally competing functions. The authors propose that the Configuration Model of the educational innovation production/diffusion/adoption process replace the RDDA Model.

The Configuration Model describes educational knowledge production and utilization institutions as relating to each other in a "community" sense rather than an organizational sense. According to the model, these institutions consist of a highly decentralized community, with complex relationships and institutional characteristics. The model implies that policy regarding education innovation should realistically reflect this complexity by encouraging the adoption of a greater diversity of approaches to innovation than is currently considered appropriate under the systems view of educational knowledge production and utilization.

The third model, the Innovative Process Model,²⁹ focuses almost exclusively on the LEA. The model hypothesizes three major phases in the innovation process: initiation, implementation, and incorporation. Perceived outcomes of implementation define success from the point of view of the participants, as do their perceptions of the change in teacher and administrator behavior, the extent to which the project was implemented as originally planned, and the expected continuation of the project.

In elaborating the Innovative Process Model, Berman et al. (1975)²⁹ retain their emphasis on the LEA. Implementation is defined as the adaptation of an innovation to local conditions. The most important factors affecting implementation success are the characteristics of the LEA institutional setting, such as the organizational climate, the motivation of participants, and the local implementation strategy. Inputs from outside the LEA, such as characteristics of the innovation and the linkage, are seen as relatively unimportant to the success of implementation. The authors argue that innovations originating outside an LEA should be left in a highly unfinished state to allow for local adaptation and development, and that any assistance from outside an LEA should be highly non-directive in nature.

Comment

Although all three models are complex and contain elements describing many stages of the diffusion process, there is a general sense in which each of the three models corresponds to one level of a distinction proposed by Havelock (1972)³⁰ and to one of three major subsections of this review. Havelock distinguished three major model orientations: the research, development, and diffusion perspective; the social interaction perspective; and the problem-solving perspective. The RDDA Model fits in the first of these categories; the Configuration Model, with its emphasis on relationships among organizations, fits generally into the second category; and the Innovative Process Model, with its emphasis on local problem-solving, fits generally into the third category. The three categories and models, in turn, correspond to three major subsections of this review: the research, development, and diffusion perspective and the RDDA Model focus primarily on innovation; the social interaction perspective and the Configuration Model on linkage; and the problem-solving perspective and Innovative Process Model on adoption.

Not surprisingly, these models closely parallel federal activity supporting the diffusion of educational innovation. As described in Section II of this report, early emphasis was placed on funding the development of innovations. As evidence accumulated that indicated only developing and making available these innovations was inadequate as a strategy for promoting large-scale reform, emphasis shifted to the creation of "links" between programs and potential adopters. More recently, another shift has been noted; this time the LEA is the locus of innovation and sustained problem solving.

Although all three models are to some degree relevant to the National Diffusion Network evaluation, the Configuration Model has the greatest relevance. The RDDA Model describes the production of innovations, a process outside the scope of this evaluation which focuses on linkage and adoption.⁷ The RDDA Model also describes diffusion relationships as linear systems, a view that is perhaps not complex enough to encompass the shifting and blurring of innovator-demonstrator and adopter roles found in Network relationships. The Innovative Process Model sheds light on the adoption process, but its emphasis on internal factors tends to overlook the potential role of external agents, such as those of the Network, in stimulating innovation. The Configuration Model describes organizational relationships beyond those found in the Network, but the flexibility and complexity with which the relationships are described provides an appropriate context for the examination of Network relationships.

The Innovation Stage

Characteristics of Innovators

Research Literature

This section of the literature review is included because research on innovations has been conducted and the characteristics of innovators are relevant to the DDs of the National Diffusion Network. The characteristics of innovators are, however, beyond the scope of the Network evaluation. The evaluation concerns how innovations were disseminated and adopted through the Network, but not how they were originally developed. The characteristics of DDs that are relevant to their role as linkers are studied in the evaluation, but characteristics relevant to their role as innovators are not.

To accurately characterize the extensiveness of literature dealing with characteristics of innovators, it is first necessary to distinguish between the LEA as a source of innovation and other sources. Considerable research literature discusses innovator characteristics in reference to LEAs, yet an examination of this body of literature reveals that it primarily concerns LEA characteristics associated with the adoption of innovations originated and developed elsewhere. Until the recent advent of such programs as Title III and the National Diffusion Network with its DDs, the LEA had a relatively poor record as an original source of innovation.³¹ As used in the literature, therefore, the term "innovator" applied to LEA characteristics is more accurately translated as "adopter." For this reason, literature dealing with LEAs is discussed in the adopter characteristics section of this review.

Excluding the LEA, the remaining sources of innovation in education include commercial publishers, state departments of education, the education faculties of colleges and universities, and the federal government through agencies such as USOE, NIE and the educational laboratories

and research and development centers they have established. Literature discussing the characteristics of these organizations is discussed in this section. Ironically, this literature is meager. Although many innovator organizations have a research capability, few have used the capability to introspect their characteristics as innovators.

One of the rare empirical studies of characteristics of innovators examined the internal communications of a research center.³²

Through staff interviews, the patterns over time of functional and social communication were determined. Communication tended to be restricted to within staff status groupings and to become more bureaucratic and impersonal over time.

A more recent empirical study also examined communication factors.³³ This study found that research and development centers did not establish effective linking mechanisms with users, had poor internal communication, and failed to cooperate with teacher education institutions.

Somewhat more common in this regard is literature that discusses innovator characteristics on a theoretical or advisory rather than empirical basis. Examples include a National Science Foundation Report advocating that a diffusion or utilization capability be created within the innovation production system,³⁴ and a paper that describes in detail how research and development organizations could maintain better contact with LEAs.³¹

Principal Dimensions

Although innovator characteristics will not be included in the evaluation, the following are among the characteristics of innovators identified in the literature as related to the production of successful innovations:

Personnel Attitudes and Knowledge--the degree of practical or problem-solving orientation of the staff, their knowledge of adopter characteristics, and their attitudes toward linkers and adopters.

Personnel Ability--the intelligence and personality characteristics of a staff, and their previous experience and training.

Personnel Communication Behavior--external communication with other innovators, with linkers and adopters, and such internal communication factors as openness, cohesiveness, and morale.

Personnel Demographics--the socioeconomic status, race, and age of a staff.

Motivation--the degree to which a staff is motivated by such factors as profit making, status seeking, or merely selfless sharing.

Diffusion Capability--the degree to which an innovator organization has also developed a utilization or linkage capability.

Research and Evaluation Capability--the degree to which an innovator organization maintains an active program of empirical research.

Complexity--the number of separate intraorganizational administrative entities, and the number of occupational specialties and their professionalization.

Centralization--the degree to which authority is centered in one administrative entity.

Formalization--the degree to which emphasis is placed on following rules and procedures in role performance.

External Relationships--accountability to users or funding sources, and competitiveness with other innovators.

Characteristics of Innovations

Research Literature

In contrast to innovator characteristics, the characteristics of innovation have received attention in the research literature. In discussing these characteristics, however, the literature generally focuses on the product, rather than the process, of innovation. That is, characteristics of innovations have been discussed widely, with relatively little attention given to the process through which they are originated and developed.

Whether conceptualizing innovation as a product or as a process, a number of researchers have attempted to compile comprehensive listings of the salient characteristics of innovations. Perhaps the most popular typology is that proposed by Rogers and Shoemaker (1971).³⁵ Their listing includes the following characteristics: relative advantage, compatibility, complexity, trialability, and observability. Another typology for describing characteristics of innovations lists 27 separate attributes; among these are: degree of commitment, gateway capacity, and impact on interpersonal relationships.³⁶ An alternative categorization of characteristics was based on a survey of over 250 local administrators, teachers, and state department of education officials in two states.³⁷ This survey yielded 6 major categories: student concern orientation, additional resource requirement, intrinsic values, consumer report, credibility, and operational implementation. Another study that reviewed 37 empirical studies of innovation implementation in education concluded that only two characteristics of innovation were critical:³⁸ explicitness and complexity.

The literature, in general, has tended to emphasize the innovation characteristics of complexity or disruptiveness and related dimensions. A review by Brickell (1971)³⁹ attempted to distinguish some of the

aspects of disruptiveness. Chief among these is the magnitude of an innovation. Innovations requiring inordinate outlays of money, energy, or time are less likely to be adopted. The extent to which an innovation requires changing a substantial part of the curriculum or has an effect on programs not directly involved in the change is also relevant. Thus, a series of case studies has shown that innovations not using unfamiliar or disruptive media or methods are most readily accepted by schools.⁴⁰

A related feature of an innovation is its compatibility with existing role definitions--for example, the extent to which it allows teachers to maintain their professional image. If the innovation reduces the teacher's function to that of a monitor rather than enabling active instruction, it is less likely to be adopted.⁴¹ Additionally, the acceptability of an innovation to a teaching staff depends on whether the staff sees the change as reducing rather than increasing existing burdens.

Numerous other studies have supported the findings that less disruptive innovations are more likely to be adopted (for example, see References 41, 42, and 43). In one major study, for example, a survey of innovations adopted by schools found that only those that were inexpensive and seemed to improve or extend a current practice rather than introduce a new one were likely to be successful.⁴⁵ Innovations requiring more than minimal alteration of programs or teaching methods were unlikely even to be attempted. One meaning of all these findings is that an innovation is acceptable precisely to the degree that it is not, in fact, an innovation. Not surprisingly, busy educators generally prefer to continue, or only moderately change, current activities rather than to initiate new ones.

Trialability also has been cited in the general diffusion research literature as an important characteristic dimension of an innovation. There is some evidence that this dimension may not be important

in the field of educational innovation, however, as one study has shown⁴⁵ schools tend to adopt innovations without trial period.

Completeness is another dimension that has been examined.³⁹ If an innovation has built-in implementation supports, such as staff training components, implementation of the innovation is accelerated.

Some innovation characteristic dimensions are closely related and have been discussed together in the research literature. Divisibility and adaptability are one example. It has been found that if an innovation is divisible and flexible enough to be adopted on a partial basis or modified to fit local conditions, then diffusion is facilitated.⁴⁶ Modifications must be left to the adopter's judgment, however; adaptations dictated by an external source can complicate implementation in a school system that is geared toward routinization and regularity.

Other innovation characteristic dimensions closely related to each other are communicability and concreteness. Educational innovations involving technology or materials are concrete and are easier to diffuse than those focusing on concepts (such as team teaching or individualized instruction) partially because they are easier to convey information about.⁴⁶ Materials can be readily distributed and altered to fit particular applications, while still retaining their basic developmental integrity.

Principal Dimensions

Among the characteristics of innovations identified in the literature as related to rate of adoption and successful implementation are:

Novelty--the absolute and relative degrees to which an innovation is new and different rather than a minor variation of existing practices.

Compatibility--consistency or continuity of the innovation with prevailing contemporary lay and professional assumptions, priorities, role definitions, and such.

Relevance--the extent to which the relationship of the innovation to student benefits is perceived as direct, apparent, and so on (a major component of "relative advantage," concept developed by Rogers and Shoemaker and used widely in the research literature).

Acceptability--extent to which the innovation is likely to arouse resistance from teachers, administrators, community; extent to which aspects of the innovation are considered controversial.

Complexity--scope/comprehensiveness of the innovation; extent to which it requires numerous changes and affects multiple curriculum areas or functions of the school.

Nature--content or subject matter of the innovation.

Target Group/Purpose--intended target group and goal (for example, to "close gaps" between low-achieving students and their peers; to maximize individual growth).

Cost--absolute and relative expenditures of time, money, and energy required; typically, costs associated with start-up or original installation and with continued operation of the innovation are both considered.

Concreteness/Salience--visibility, tangibility of the innovation; degree to which it is based on materials, technology, and physical objects rather than ideas or concepts.

Centrality--extent to which the innovation affects major functions of the adopting institution rather than peripheral areas.

Locus of Implementation--level at which the innovation is installed and operated (classroom, school, or district); extent to which adoption/implementation require collaboration and cooperation (that is, the innovation cannot be adopted and operated by a single, autonomous individual).

Completeness--degree to which an innovation is a complete entity, requiring no additional components for implementation.

Discreteness--extent to which the innovation operates in the classroom/school/district; extent to which it constitutes an "add-on" rather than a change in the overall operating system.

Interdependence/Divisibility--degree to which components of an innovation can function independently; extent to which changes in one aspect will affect other aspects.

Integrity/Adaptability--degree to which an innovation can be modified without losing its essential character (includes flexibility of content, target group, locus of implementation, and the like).

Time Frame/Phasing--length of time required for trial, implementation, refinement, incorporation, and detection of results; incorporates the notion of "trialability" (feasibility of implementation on a limited basis before a full commitment).

Popularity--popular image of the innovation type; extent to which innovation reflects currently popular ideas, practices, materials, and such.

Repute--reputation and credibility of the innovation, based on claims of success from developers, early adopters, and so on.

Comment

Most of the research literature on innovation ignores the characteristics of the innovator to concentrate on the characteristics of the innovation. But this examination of innovation characteristics has so far failed to yield one important tool for research on diffusion of educational innovations; that is, a generalized classification scheme for innovations.⁴⁷ Without some way of classifying innovations along standard dimensions of difference, studies of their diffusion are not generalizable.

The difficulty of classifying innovations along standard dimensions is a particular problem for the National Diffusion Network evaluation, because the diffusion of a large number of different innovations is being studied. Thus, to evaluate the Network, a way must be found to avoid treating each program or project diffused through the Network as a discrete case.

A general classification scheme for innovation attributes could be defined in either functional or conceptual terms. Examination of the difficulties inherent in either of these approaches indicates why such a classification scheme has not already been developed. Differentiation and validation of innovation attributes on a functional basis would require determining their individual effects; however, any measurement that associated various effects of innovations with individual attributes of the innovations would be complex, costly, and in many cases, impossible.

Even if the easier-to-operationalize conceptual approach is adopted, difficulties remain. Attributes of innovations can be conceived from different viewpoints. Attributes considered salient by the developers of an innovation may differ considerably from those considered salient by the adopters; yet, both of these sets may differ from the attributes considered salient by persons responsible for dissemination of the innovation. Problems in reconciling these differing viewpoints tend to undermine the generality of conceptually based classification schemes.

Since adoption is usually the dependent variable in studies of diffusion, many investigators have chosen to emphasize the conceptual point of view of adopters in defining the salience of innovation attributes. The complexity or costs of an innovation as perceived by an adopter are more likely to be directly associated with adoption than are ratings of innovations along such dimensions by other sources.

Accordingly, the National Diffusion Network will primarily emphasize the adopter concepts of innovation attributes although developer attribute ratings also will be obtained. The evaluation will obtain these ratings along the attribute dimensions listed above. Adopters will characterize the programs they have installed; developers will characterize the programs they have developed. These ratings will permit comparisons to be drawn both between programs and between the concepts of adopters and developers.

The Linkage Stage

Characteristics of Linkers

Research Literature

Literature concerning characteristics of the linker is as rare as literature concerning characteristics of the innovator. The reason is probably the same in both cases. At the stages of innovation and linkage, studies of the diffusion of educational innovation focus primarily on programs and strategies, not agents. In these studies, the characteristics of innovator and linker agents are covered only where their relationship to innovation and linkage processes is rather direct.

The neglect of linker characteristics in the literature is difficult to understand because the role is an important one in the diffusion process. Broadly conceived, the linker role entails the communication of information between the innovation and adoption stages of the diffusion process. The information flows in both directions. A linker provides information about innovations to adopters and helps adopters to acquire the information resources, such as expert consultants, necessary for implementation of innovations. A linker also provides information to innovators about not only the reception of their products, but also the need for product modification or the production of new innovations.

A major study which has examined linker characteristics is an evaluation of the Pilot State Dissemination Project conducted by the Bureau of Applied Social Research at Columbia University.⁴⁸ The Pilot State Dissemination Project was a limited field test in which educational extension agents acted as consultants and as intermediaries between research information banks--primarily the ERIC system, and potential users--primarily teachers. Because the role of "educational extension agent" was developed largely by the individual occupying the position, the evaluation focused to some extent on agent characteristics. Successful agents had an ability for rational problem solving and skill at interpersonal relations and the informal manipulation of LEA power structures. A linker organizational characteristic important for the success of the project as a whole was the rather pronounced decentralization of authority.

Another example in the literature in which a linker characteristic has been given prominence is the market segmentation research conducted by the Far West Laboratory for Educational Research and Development.^{49, 50} Concerned with the dimension of linker research capability, these studies examine the feasibility of adapting marketing research techniques to the diffusion of educational innovation. Based on the concept of market segmentation, the potential "market" for a particular educational innovation is segmented by the discrepancies that exist between a potential user and the requirements of the innovation. A group, or market segment, of potential users having a particular discrepancy in common is then approached one way by a linker while another group having a different discrepancy is approached in another way. Perhaps because the situation in education differs so widely from the marketing context in which the technique was developed, it has not, as yet, found wide application among linkers.

Principal Dimensions

The linker role in the Network is carried out by both Facilitators and Demonstrators since both engage in diffusion activities. Characteristics of linkers identified in the literature fall into three general areas--personnel variables, interface variables, and organizational variables. The Network evaluation will emphasize the first two groups of variables. Since a linkage "organization" in the Network may include as few as one or two full-time staff members, emphasizing such organizational features as complexity and formalization is inappropriate in these cases. The interface between a linker organization and a school or district organization will be emphasized, however. Characteristics of linkers relevant to the Network evaluation are:

Number--number of full- and part-time staff.

Personnel Qualifications--training and previous experience.

Personnel Allocations--how staff assignments are made (for example, by region or subject area; in advance or in response to identified needs and interests).

Funding--level of financial support from federal and other sources; funding priorities; allocation of funds over time and across activities/target groups.

Timing/Schedule--pattern of activities over time; balance of schedule and relevance to school year; process by which priorities are set and scheduling decisions are made.

Internal Evaluation--degree to which documentation and assessment activities are conducted; goals and purposes of evaluation; types of information collected; impact on subsequent activities.

Interface will be examined between participants serving the same or different roles. Dimensions of interest include:

Participant Interactions--context, type and frequency of interactions; extent to which expectations and role perceptions converge or conflict.

Accessibility--perceived availability for assistance (answering questions, providing materials, providing training, visiting adopter sites or receiving visitors, and such).

Proximity--extent to which participants interact primarily with others who are close to them geographically.

Credibility--three aspects of credibility are relevant: competence (perceived expertise, reliability of professional credentials); trustworthiness (perceived sensitivity to needs and interests of others, dependability); and reputation (previous history of success or failure).

A final group of variables involves organizational features of the Network which may influence activities carried out by individual participants; dimensions of interest include:

Organizational Context--influence of the organization within which linker group is located on diffusion activities; ways in which activities are facilitated or hindered.

Complexity--number and functions of separate levels and units included within the Network.

Centralization--extent to which authority rests in a single body; focus of decision-making and identification of any competing groups.

Formality--degree to which activities are governed by rules and specified procedures; scope, activities, and influence of Network Steering Committee.

Compatibility--awareness within the Network of alternative diffusion strategies and organizations; interface with alternative efforts.

Characteristics of Linkage

Research Literature

In the research literature, the characteristics of the linkage between the source of an innovation and its adopter have not been covered as extensively as have the characteristics of the innovation. Rather than considering linkage characteristics per se, researchers have more often discussed diffusion strategies. In these strategy discussions, however, the nature of the linkages proposed is often clear or can readily be inferred.

Some researchers have attempted to define categories or types of linkage activities. One listing included conveying information, consulting on problems, training and leading by initiating and guiding the adoption process.⁵¹ An alternative concept lists the following types of linkage activities: user self-servicing (helping users to help themselves), need processing (communicating user needs to resource persons), solution building (developing solutions to problems), and solution processing (transmitting solutions to problems).^{52, 53}

Frequency of linkage activities is another important dimension that has been studied. Studies of innovation diffusion and implementation generally have shown that installers of an innovation need help on a frequent basis.^{54, 55} Messages sent to facilitate the implementation of innovations must be repetitive and potent.⁵⁶

The dimensions of linkage age and novelty also have been examined. For example, on the question of whether the linkage should be old or new, Miles (1964)⁴⁶ notes that with an old, preexisting relationship between innovation source and adopter, linkage failure is less likely. Brickell (1971)³⁹ has examined the extent to which innovation diffusion can use preexisting, professionally based linkages. A professionally

based linkage requires contacting school administrators and teachers through their professional associations or other regular sources of professional information.

Another linkage dimension is that of channel or media. Attention here has focused on whether a linkage is better if based predominantly on personal, face-to-face contact or on impersonal channels of communication.⁵⁷ In the diffusion of educational innovation, personal contact consists of change agents, meetings, and demonstrations; impersonal contact usually consists of print-based information networks. The literature indicates that although both personal and impersonal contacts are important, there may be some tendency to overlook the importance of personal contact in the formulation of actual adoption and implementation decisions. In a survey of school districts, Wolf found that most innovators relied primarily on personal channels of communication.⁴⁵ Innovators became aware of innovations and reached decisions to adopt primarily through colleague contact, meetings and workshops, institutes, and courses. In general, opportunities for direct personal participation such as small group experiences, were the most important linkage factors in the diffusion of educational innovations.

Some related research has focused on the sequence in which different channels or media are used in the course of successful implementation of an innovation. One study discerned the following sequential order of channels: colleague interaction and formal course work, professional meetings and conferences, and face-to-face communication.⁵⁸

Closely related to personal contact is the linkage dimension of reciprocity or participation. Generally, resistance to adoption is minimized if potential adopters have joined in diagnostic efforts that lead them to agree on what the basic problem is and how the innovation will help solve it.⁵² Probability of adoption will be even greater if

potential adopters are able to collaborate in the development of the innovation,⁴⁰ or if they commit themselves to adoption early in the innovation's development.⁴³ If such participation does not occur, potential adopters not only may fail to implement the innovation, but also may actively sabotage it.⁶⁰

Another aspect of reciprocity is the activity or passivity of the source or target in the linkage process. For example, both source and target could be extremely passive, in which case linkage is probably ineffectual; or both could be extremely active, in which case linkage is either effective or confrontation occurs.

One study has proposed three conceptual categories of common activity-passivity strategies in linkage.⁶¹ The first of these is the empirical-rational approach in which the source is primarily the active party. In this approach, the source marshalls convincing evidence regarding the quality of an innovation and then presents the evidence to the target. The second approach is termed normative-reeducative; in this, both source and target are about equally active and work together to define problems and seek solutions. The third approach category is power, and the source is predominantly active. In this approach, the source acts to limit the target's alternatives, shape the consequences of the target's actions, or directly influence or control the target's actions.

Principal Dimensions

Characteristics of individual linkage activities or diffusion tactics, as well as aspects of overall diffusion strategies (combinations of activities), have been identified in the literature. In the Network evaluation, linkage activities and strategies associated with all phases of the adoption process, initial and secondary awareness, demonstration, training, and follow-up assistance will be examined. The

following characteristics of diffusion activities and strategies are considered relevant:

Type/Kind--content of activity; orientation toward producing cognitive or behavioral change.

Technique/Method--method(s) used to carry out activity (for example, mailout, conference, visit); familiarity or novelty of methods; extent to which methods are standardized or adapted to individual situations.

Media/Channel--mode of delivery or presentation (print, artwork, audiovisual materials, lecture, demonstration); formality of delivery mode; use of existing channels.

Completeness/Extent--level of detail at which information is presented.

Volume--absolute and relative amounts of information conveyed; inclusion of information about entire program or selected components only.

Content Level--extent to which activity focuses on abstract concepts or on concrete, explicit practices.

Target/Scope--intended receivers or target group; extent to which activity is directed toward entire population served or to selected subgroups; specific targets of activity within adopting units.

Cost/Effort--cost and effort associated with preparation/presentation of activity.

Frequency--time intervals between contacts; repetition of activities.

Sequence--extent to which a standard sequence of activities is used or to which activities are contingent upon results of earlier activities.

Reciprocity/Feedback--use of one-way and two-way communication; activity/passivity of source and target in the process of information exchange; extent to which diffusion activities occur in response to requests from adopters.

Redundancy--extent to which alternate methods and/or channels exist for conveying the same or

similar information; extent to which these methods or channels are used.

Campaign--degree to which activity entails "high pressure" tactics designed to "sell" adopters on programs.

Persistence--extent to which source or initiator makes repeated attempts to convey information or generate a response from recipient; amount of follow-up.

Sanctions--rewards or sanctions promised or provided.

Comment

Many gaps in knowledge exist with regard to both linker and linkage characteristics. Linkage characteristics have received somewhat more extensive coverage in the literature than have linker characteristics.

Perhaps one reason linker characteristics have not been more extensively studied is that the linker role is sometimes a difficult one to define and distinguish. Often the linker role is performed on a part-time or marginal basis by an entity whose major function is elsewhere. Examples of such entities include district administrators responsible for disseminating information about their own innovations or acquiring information about those of others, and research organization officials responsible for disseminating information about innovations their institutions have developed. These persons may view their linker function as marginal to their primary responsibilities of teaching, or research and development. In such cases, the linker role is sometimes overlooked by both performers and evaluators. Most of the research reviewed in the subsection on innovator characteristics castigated research and development institutions for not also performing a linker role in addition to their innovator role.

In the National Diffusion Network, a variety of entities perform linker roles, some on a part-time or marginal basis and others on a full-time basis. The evaluation will attempt to evaluate relevant characteristics of all these entities. Characteristics of DDs and Facilitators will be most important because they are the major linkers in the Network. Other entities, such as Far West Laboratory (a source of technical assistance), SRI (a source of evaluative feedback), and even USOE are sources of information for Network activities and thus perform linker roles. Relevant characteristics of all of these entities and characteristics of the interfaces existing between them and adopters will be examined in the Network evaluation.

Even though linkage characteristics already have received greater coverage than linker characteristics, consideration of the part communication variables play in effective linkage has been inadequate. Few attempts have been made to document how such communication variables as delivery mode, pattern, schedule, and volume of information relate to the rate and amount of innovation adoption.

The National Diffusion Network evaluation will strive to provide documentation in this area. The characteristics relating to communication aspects of linkage which have been listed above will guide data collection efforts. These data will permit analysis of how such factors as frequency and redundancy of communication relate to phases of the adoption process.

The Adoption Stage

Characteristics of Adopters

Research Literature

In marked contrast to literature concerning the characteristics of innovators or linkers, literature concerning the characteristics of

adopters is extensive. It is the most comprehensive of all literature concerned with the diffusion of educational innovation.

The literature at least touches on many different dimensions of adopter characteristics. One large group of studies examines characteristics of the administrative and teaching staff related to the adoption of innovation. Another group examines organizational characteristics of school districts since the school district is the most commonly studied unit of adoption. Finally, many studies examine characteristics of the environment in which the school district operates that are related to adoption of innovations.

Of the studies on staff characteristics, one important group of studies has examined the characteristics of school superintendents. The superintendent has been described as the most important individual in a school district with regard to the diffusion of innovation because he is often the only person whose regular duties can readily encompass those of an internal change agent. Characteristics of superintendents that are related to innovativeness include a high degree of professional training and an awareness of the existence of potential innovations.⁶² Innovative superintendents also tend to have high social Network involvement--as measured by contacts with other superintendents, and high status--as measured by amount of education and by the prestige accorded them by other superintendents.⁶³

Characteristics of the teaching staff associated with the diffusion of innovation also have been studied extensively. In general, these characteristics are associated with a teacher's activity and ability levels. For example, level of education and job satisfaction,⁶⁴ attendance at out-of-town educational meetings,⁶⁵ and varied experiences outside of education⁶² have been found to be correlates of innovativeness among teachers.

Morale is a staff characteristic found to relate significantly to successful implementation of innovation in schools.⁶⁶ Morale usually is defined in terms of staff communication patterns. Goodlad and his associates (in Bentzen, 1974)⁶⁷ have studied staff communication as a critical component of self-renewal. Self-renewal is an internal school process in which school problems are identified; it is a necessary prelude to the search for innovative solutions to problems. The self-renewal process is generated by such communication factors as the degree to which: principal and teachers agree on school issues, widespread participation in school decisions is encouraged, and a widespread sense of influence over school concerns is present among a staff.

The last factor has been studied in a more structured fashion under the term locus of control.⁶⁸ School staff members can be characterized on two locus of control continuums, internal and external. The internal control characteristic is that action is not futile and that one can affect his destiny. The external control characteristic is associated with a sense of inevitability, that events are controlled by fate or some other external force. School staffs with a high sense of internal control and a low sense of external control tend to be more successful in implementing innovations.

Morale and locus of control are important incentives for individuals in the adoption process. On an organizational level, there are three basic types of incentives: pressure or coercion, additional subsidy, and problem solving.^{31, 39} Pressure for innovation can arise from such sources as court decisions, state legislative or regulative mandate, the influence of industry or special interest groups, and community constituencies pushing for reform. Subsidy may be made available in the form of additional funding, such as that provided through federal legislation, or in the form of directly supplied materials or equipment. Problem solving depends on nonmaterial rewards, such as improvement of

an educational program and perhaps increased prestige through successful innovation.

The type of organizational motivation is a key factor in the success of innovation adoption. One recent study found that projects initiated merely to take advantage of additional funds typically disappeared with termination of the subsidy; projects that were initiated on a problem-solving basis were more likely to be incorporated on a permanent basis.²⁹

Previous experience with innovation has been discussed both as a staff characteristic and as an organizational characteristic in the literature. A number of investigators have noted the centrality of such experience to successful implementation of innovations.^{43, 69, 70, 71}

One advantage of previous innovation experience sometimes overlooked is that it endows the school district with a reputation as an innovator. Such a reputation can become a factor contributing to innovativeness in and of itself.³⁹ Insiders and outsiders come to expect the district to be in the forefront of change, and this expectation influences the district's behavior with regard to innovation.

Negative aspects of dimensions of school district characteristics related to innovation adoption also have been considered in the literature. School district characteristics present many potential barriers to the diffusion of innovations, and some of these are practically endemic to these systems. Because they are assumed to be constant, these negative factors are not measured in the Network evaluation. Miles (1965) has attempted to compile a complete list of these inhibiting characteristics.⁷² Among those he includes are:

Absence of a Change Agent--the superintendent can fulfill this role to some extent, but his objectivity and effectiveness in its performance are limited; since he is a part of the organization

being changed, the changes he advocates or prescribes also include changes of his own practices.

"Domestication" of the Public Schools--schools are a domesticated organization in that they must offer a service to clients who by and large must accept the service as offered; this monopolistic relationship tends to produce a stable environment in which the need for and interest in change are restricted.

Goal Ambiguity--school districts have difficulty in specifying goals partially because of the difficulty in measuring the desired output of the education process.

Input Variability--variability in student and teacher abilities is wide, and thus uniform implementation of innovation is difficult.

Role Performance Invisibility--teachers in autonomous classroom settings are generally invisible to peers and superiors in the performance of their roles; under these conditions, it is difficult to control for the subversion of innovations.

Low Interdependence--the role performance of one teacher generally has little direct effect on another's performance of his role; since there is little need to work together, the diffusion of innovation is slowed.

Vulnerability--school districts are timid about innovating because they are subject to control, criticism, and a wide variety of legitimate demands from the surrounding environment.

The effect of some other dimensions of school district characteristics on the diffusion of innovation is more ambiguous. Organizational complexity, for example, has been cited in the literature both as a hindrance to and a promoter of innovation. Baldrige found evidence that structurally complex and large organizations were more innovative, and concluded that structural complexity in schools should be increased to make them more receptive to change.⁸⁹ However, Zaltman et al. found that although organizational complexity favors the acceptance of innovations,³⁶ more complex organizations have less success implementing change;

complexity favors the entrance of the innovation, but retards effective cooperation in its implementation. Brickell concluded that middle ranges of complexity and size in school districts are most conducive to innovation because small districts cannot spare the resources and large districts have cumbersome bureaucracies.³⁹

A dimension closely related to organizational complexity is that of centralization, the distribution of authority in an organization. Authority and power either can be dispersed in a school district (because of such factors as a powerful teachers' union and organized community groups) or highly concentrated in the district administration. Wide dispersal of authority usually hinders innovation because competing groups have difficulty in reaching agreement; centralized authority can promote innovational efficiency.^{38, 67}

Other researchers, however, have examined the problems raised when activation of innovation must depend too heavily on authority. One common pattern is that the change is not sustained over time or is somehow sabotaged by persons coerced into participation.^{40, 60, 73} In view of such problems, many researchers have concluded that significant educational planning and decision-making must be a collaborative effort with all major school system constituencies participating.⁷⁴

Often closely related to centralization is the dimension of formalization, defined as the emphasis placed on following specific rules and procedures. It has been suggested that low formalization tends to facilitate earlier phases of the adoption process, but hinders later phases.³⁶

The district characteristic of having a capability for conflict resolution has been judged important at all phases of the adoption process.⁷⁵ Conflicts can arise at any phase, but if the issues can

be explicated, discussed, and adequate solutions found, the adoption process is more likely to succeed.

Another district characteristic cited in the literature as important for adoption of innovations is the capability for planning and leadership. Districts having an adequately developed planning capability have been found to continue use of innovations funded by Title III longer than districts without this capability.^{42, 43} The existence of a planning and leadership capability also has been related positively to the number of innovations being used in districts⁷⁶ and to the effectiveness of curriculum innovation implementation.^{77, 78} A negative aspect of planning capability, however, is that instead of facilitating innovation,⁷⁹ it may be used in postponing a decision to implement.

Closely related to the capability for planning is the capability for evaluation. Although evaluation would seemingly enhance innovation, one study found that the collection of evaluation data was irrelevant in decision-making regarding the continuance of innovation projects.²⁹ A number of other investigators have found negative relationships between evaluation and the diffusion of innovation in a school district. Havelock (1974) found such a relationship in a survey of a sample of 400 school superintendents.⁷⁶ In a survey of Title III projects in California, Miller found a negative relationship between the amount of money allocated for evaluation and the continuation of an innovation.⁴² These effects can probably be attributed to the dampening effect on enthusiasm that evaluation can have when little progress is revealed and, possibly, to a phenomenon called "evaluation anxiety" in which energy is directed away from implementation and toward the development of defenses against evaluation.⁸⁰ An alternative explanation is that evaluations often are applied before an innovation has had time to generate measurable effects.

One final school district characteristic given some prominence in the research literature is the degree of contact with educational agencies outside the district. A number of studies have found a relationship between extensive external contact and innovative behavior in a school district (for example, see References 81, 82, 83). School districts with viable linking mechanisms to environments relevant to innovation (such as universities) tend to adopt and implement more innovations than do those without such mechanisms.⁶⁹ One reason for this relationship is that contact with other systems with relevant knowledge and experience saves a district from mistakes and wasted effort.⁷⁶

Dimensions of the setting in which a school district operates are also relevant to its behavior in the diffusion of innovation according to comprehensive research conducted under the direction of Paul Mort at Columbia University. A major finding from this research that was replicated many times by Mort and his students is that relationships exist between innovativeness and the financial resources a community makes available to its schools.

The Columbia research has been synthesized by Ross.⁸² From this synthesis, a composite picture can be compiled of the community characteristics that foster innovative schools. The community is heterogeneous in population, but has a high percentage of citizens employed in white collar and professional occupations. There is a high percentage of owner-occupied dwellings. The community also has many cultural advantages. Finally, among citizens there is a high level of understanding of what schools can and cannot do.

Brickell has suggested that perhaps it is not the absolute, but rather the relative level of spending a community allocates to its schools that is important.⁸³ Regardless of its absolute level, if a district's spending is much greater than other districts in its geographic

area, this difference tends to thrust the district into a position of leadership in the area. As a leader, the district is expected to innovate and tends to fulfill these expectations.

Brickell also has noted the importance of a community's growth pattern for innovation. A school system increasing in size is more likely to adopt innovations than one decreasing. New schools and school systems with new staff are much more open to change as internal patterns have not yet been set.³⁹

Principal Dimensions

Chief among the district-level organizational features identified in the literature which will be examined in the Network evaluation are:

Complexity--size and scope of district (elementary, secondary, unified); number of separate intraorganizational administrative entities and number of occupational specialties.

Formalization--number, type, and rigidity of rules; degree to which emphasis is placed in following rules and specified procedures in carrying out roles and functions.

Centralization--degree to which authority rests in a single administrative body; lines of authority; hierarchical structure.

Conflict Resolution/Problem Solving--capacity for identifying and resolving problems or conflicts; ways in which problems are identified and solutions are developed and implemented; individuals and groups involved in problem solving.

Leadership--extent to which the district has exerted a leadership role in the past; locus and roles of opinion leaders.

Organizational features associated with adoption of innovations that will be studied primarily at the school building level include:

Control Structure--relationship between those who have input to decisions and those who are affected by the decisions; roles of individual teachers, teacher groups, administrators, etc., in various types of decisions; governance structure.

Faculty Interdependence--provisions for sharing resources and facilities among faculty members; extent to which activities of one faculty member affect others.

Departmentalization--formal or informal organization of the school into separate units (by grade level, subject matter, and so on); autonomy of separate units.

Internal Evaluation--capability for evaluation; kind and frequency of assessment of school programs and activities; impacts of evaluation on subsequent activities.

Morale--general feelings of staff members toward their jobs and work environment; sense of security, enthusiasm, prestige, and professionalism.

Attributes of personnel located within organizations that have adopted Network programs also will be examined. Personnel variables that emerge from the literature as important for study are:

Locus of Control--sense of self-control (internal control) versus belief in fate control (external control).

Demographics of Personnel--age, academic background, teaching experience; length of association with current school/assignment; personnel turnover rates.

Faculty Rapport--cordiality and congeniality within the teaching staff; acceptance of colleagues; internal sense of consensus; absence of cliques.

Faculty/Administration Rapport--cordiality and congeniality between teachers and administration; formal and informal relationships; extent to which principals and other administrators are perceived as supportive, sensitive to teachers' needs, interests, and talents; type and frequency of teacher/principal interactions.

Faculty/Student Rapport--relationships and communication patterns between teachers and students.

A fourth group of variables is related to general features of the climate into which innovations are introduced. The set of adopter context or environmental variables to be examined in the current study includes:

Previous Innovation History--number, type, scope of other innovations previously tried; length of association with other innovations; perceived successes and failures.

Community Receptivity--community-level acceptance/resistance to change and to federal intervention.

Fiscal Solvency/Resource Availability--sources of district income (federal, state, and local); per-pupil expenditures; availability of resources for innovative efforts.

Political Climate--community image as liberal or conservative; level and nature of controversy over educational issues (busing, teachers strikes, and such); history and results of recent elections (school board, bond issues, and the like).

Community Demographics--size, urbanism, cosmopolitanism, geography, or community.

Ethnic/Racial Composition--of community, staff, and students.

The four groups of variables listed above pertain to operating characteristics of the organizations and settings into which innovations are introduced and of the personnel who adopt and implement the innovations.

A fifth group of variables is related directly to institutional support for innovation in general and for the specific innovations being introduced through the auspices of the National Diffusion Network. These "adoption risk" variables pertain to receptivity of adopting units toward the innovations and the external agents who provide support for adoption and implementation. Major variables of interest for the Network evaluation are:

Innovation Sanctions--extent to which educators are rewarded or sanctioned for trying new ideas and programs; criteria for professional advancement; incentives provided for professional development.

Extent of Current Diffusion of Innovations--number, type, and scope of other federal, state, and local programs currently operating or being considered for adoption.

District Support/Backing--level of awareness, interest, commitment (of staff time, money, resources, and facilities), and participation of superintendent and central office in innovation and change.

School Board Support/Backing--level of awareness, interest, commitment of school board.

Professional Association Support/Backing--awareness of and interest in innovations; extent to which innovation is consistent with or competes with association programs and priorities.

Principal and School Staff Support/Receptivity--extent to which innovation is perceived as relevant, useful, and feasible by the principal, participating teachers, and other teachers; type and extent of support for the innovation provided by the principal.

Perception of Innovator Credibility--perceived expertise and dependability of the developer.

Adopter/Innovator Rapport--cordiality and congeniality between innovator and adopter; perceived similarities in interests, orientation, goals, personality.

Perception of Linker Credibility--perceived expertise and dependability of the linker or facilitator.

Adopter/Linker Rapport--cordiality and congeniality between linker and adopter; perceived similarities in interests, orientation, goals, personality.

Characteristics of Adoption

Research Literature

The literature, with a few exceptions, does not describe characteristics of the adoption process. Empirical studies of the adoption process are particularly rare. An example of one of these is a survey that examined the spread of high school language laboratories.⁸⁴ The survey used open-ended questions to elicit a retrospective description of the language laboratory adoption process in 62 high schools. In two-thirds of the high schools, the adoption process took less than two years from first official mention to installation. The impetus for decision-making throughout the process rested primarily with the language teaching staff, with the administration merely granting final approval. Other studies have observed this same decision-making pattern in which internal school groups, primarily teachers, are the active element in initiating an innovation while school boards and other groups retain^{85, 86} final adoption decision authority.

Studies examining the adoption process from a conceptual or theoretical, rather than empirical, viewpoint are somewhat more common. An example of this approach is the Concerns-Based Adoption Model that describes seven phases of use in the adoption of an innovation.⁸⁷ The first three phases are non-use, orientation, and initial training. The fourth phase is mechanical use, which refers to the trial or pilot use of an innovation. The fifth phase is independent use, which refers to limited individual use of the innovation, and the sixth phase is integrated use, which refers to collaboration and cooperation in use among individuals in an adopter organization. The final phase is renewing use, in which evaluation and modification of the innovation occur.

A number of other alternative concepts of adoption process phases or stages are discussed in the literature. In general, these

models agree on making two distinctions among phases. The first is a distinction between an adoption decision and the activities which follow that decision, generally termed implementation.^{36, 38} The second distinction is between the implementation phase, which constitutes initial use of an innovation, and a later phase in which the innovation has become an integrated, routinized, and sustained part of school activity.^{36, 88}

The literature reveals less agreement regarding the order, if not the existence, of two earlier phases in the adoption process. The controversy surrounds the issue of which comes first: recognition of the need for a better way, or awareness of the existence of a better way. One in-depth case study of the adoption process in a school district found that recognition of need preceded awareness of an innovation solution.⁸⁵ Others have argued the reverse; still others have concluded that the two occur nearly simultaneously as a "continuous movement between mediating on one's plight and availing oneself of objective information."⁸⁹ Regardless of exactly when it first occurs, however, recognition of need is generally recognized as crucial at each phase of the adoption process; without it, the process tends to falter and die.⁹⁰

The negative aspects of the adoption process, the process of nonadoption or rejection, also have been modeled. One study distinguished five phases of rejection: awareness, disinterest, denial, trial and rejection.⁹¹ The model was developed on the basis of interviews with teachers who had rejected the use of audiovisual media.

Both positive and negative aspects of the dimension of adaptation in the adoption process also have been examined in the literature. On the positive side, one recent study has collected data that indicate the important role of adaptation or modification of an innovation in ensuring its permanent adoption.²⁹ Adaptive mechanisms which help to ensure permanence include local material development, reduction or

modification of idealistic project goals, amendment or simplification of project treatment, and downward revision of expectations for behavior change in staff or students.

On the negative side, it has also been noted that adaptation frequently is carried to such an extreme that innovations tend to be adopted in name only.⁹² The essential features of an innovation may be modified to the extent that their original value is lost. At the conclusion of the adoption process, the innovation either may represent a change different from that intended by its developers or no change at all.

Principal Dimensions

Among the dimensions or phases of adoption identified in the literature are:

Awareness--the source, type, extent, completeness, and flow pattern of information about an innovation in an adoption setting.

Adoption Decision--includes such aspects of the choice to try an innovation as: participants involved, strategy used in reaching consensus, commitments made, scope, and impact.

Implementation--includes such aspects of the initial period of use of an innovation as: type and extent of trial of the innovation; nature, scope, centrality, pattern, and degree of change introduced by the innovation; and nature and scope of adaptation or modification of the innovation.

Incorporation--the length of time and degree of completeness for an innovation to become a standard feature of an adoption setting.

Evaluation--the formal or informal determination of the extent to which an innovation meets staff expectations, is cost-effective, introduces reasonable changes, is feasible to implement, and, in general, constitutes an improvement over previous practice.

Secondary Diffusion--the extent to which an innovation spreads from one adoption setting to others.

Comment

In regard to innovation and linkage, the literature devotes relatively little attention to agent or role characteristics of individuals and organizations. Instead, the emphasis is generally on processes, strategies, and products (that is, characteristics of the innovations developed or the linkages used). With respect to adoption of innovations, this situation is reversed; the literature tends to focus on characteristics of adopters and adopting units rather than on processes, products, or strategies.

Despite the relatively heavy attention to characteristics of adopters, the literature coverage is uneven. Following a general bias in innovation diffusion research, the tendency has been to focus more on the individual than on organizational characteristics. Coverage is light on descriptions of the organizational systems into which educational innovations are placed. Several critics (for example, see References 47 and 93) have noted that little research has been done on decision-making processes within adopter organizations and have called for much greater concentration on this aspect.

The little organizational research that has been done has focused almost exclusively on district level characteristics because districts are the most commonly studied unit of adoption. More study is needed of individual schools as adopting units. Several of the organizational characteristics that have been studied at the district level are not as applicable at the school level (for example, complexity, centralization, and the role of the superintendent). The Network evaluation thus will focus on school level characteristics (such as the role of the principal) as well as the more commonly referenced district level characteristics;

adoption may occur on a school rather than a district level and implementation may vary significantly across buildings.

Coverage of adoption process characteristics not only is sparser than that of adopter characteristics, but also is uneven. Earlier phases of the adoption process tend to be covered more extensively than later phases. Characteristics of the awareness and adoption decision phases have been covered more extensively than have characteristics of the implementation phase. Virtually no research has been done on the last phase, the long-term incorporation of innovations. Research into the reasons for innovation discontinuance or rejection also has been neglected.

Study of the adoption process has been complicated by several factors. One of these is that the literature offers no generally recognized criterion for the definition of adoption. Studies indiscriminately describe innovations as "adopted" at any one of a number of different phases of the adoption process. The decision to use an innovation, trial use of an innovation, pilot implementation, and full implementation are among the various criteria used in the literature to define adoption.

Even if general agreement could be reached on using a particular process phase as the criterion for adoption, the definition would still be complicated by considerations of unit and adaptation. For example, if a school district is used as the unit of adoption, what percentage of classroom or school units would have to implement an innovation to qualify the district as a whole as an adopter? What percentage of a district's central staff, principals, or teachers would have to be aware of an innovation, before the district as a whole could be considered aware? With regard to adaptation, at what point in the adaptive process does an innovation lose its identity and become something else which is adopted in its place?

In addition to a solution of definitional problems, more adequate measurement of the adoption process is needed. Basically three types of measures are available: observation of adopter activity, examination of adopter records, and self-report by an adopter official. Most studies have relied on adopter self-report despite this measure's obvious subjectivity. To increase the validity of adoption measurement, self-report should be accompanied with other measures.

The National Diffusion Network evaluation proposes to deal with this measurement problem in two ways. First, self-report data concerning adoption will be collected from multiple sources: DDs, SFs and adopters. These multiple sources will enable a corroboration of evidence across sources to enhance validity. Second, site visits will be conducted to a selected sample of adopters. These site visits will help to substantiate self-report data from the sites through observation of activity and examination of school and district records.

Another measurement need identified in the literature is for the collection of data describing the adoption process over a number of different time points. Most studies measure adoption at only one point in time. Adequate measurement of any process, including those of innovation and linkage, requires the collection of data at more than one point in time, but the need for data over-time is particularly great in measurement of the adoption process. Retrospective self-reports of activity during the adoption process are particularly subject to bias, and existing records may be inadequate to describe the process as it actually occurred.

The scope of the National Diffusion Network evaluation allows for the collection of data over-time; a minimum of two points in time will be used. An initial survey already has been conducted of schools and districts that received training during the 1974-75 school year or that

were committed as of September 1, 1975, to receive training before installing Network projects. A more extensive survey of these adopters, as well as others who became adopters during the 1975-76 school year, is planned for Spring 1975. The collection of data at these two points will permit some analysis of the adoption process as it occurs over time.

Conclusions

This overview of the research literature concerning the diffusion of educational innovation has described three major models and characteristics of the three major stages of the diffusion process. The National Diffusion Network incorporates features of all three models, and characteristics of all three major stages are relevant to evaluation of the Network. The Network evaluation will examine the characteristics of innovations, linkers, linkages, adopters, and adoption. Only characteristics of innovators are beyond the scope of the evaluation. Research coverage of the characteristics has been uneven to date. The Network evaluation will help to fill some of these gaps, particularly those found in knowledge of linker, linkage, and adoption characteristics.

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